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Suicide prevention topic 4:

Are different triage models associated with
different outcomes in people presenting
following suicide ideation/threat/attempt?

A critical appraisal of the literature

Shelagh Dawson

New Zealand
Health Technology Assessment

Department of Public Health and General Practice
Christchurch School of Medicine
Christchurch, NZ.

Division of Health Sciences, University of Otago

NEW ZEALAND HEALTH TECHNOLOGY ASSESSMENT (NZHTA)
THE CLEARING HOUSE FOR HEALTH OUTCOMES AND
HEALTH TECHNOLOGY ASSESSMENT

Department of Public Health and General Practice
Christchurch School of Medicine and Health Sciences
Christchurch, New Zealand

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CONTACT DETAILS

New Zealand Health Technology Assessment
The Clearing House for Health Outcomes and Health Technology Assessment
Department of Public Health and General Practice
Christchurch School of Medicine and Health Sciences
P O Box 4345
Christchurch
New Zealand
Tel: +64 3 364 1152 Fax: +64 3 364 1152

E-mail: nzhta@chmeds.ac.nz

Web Site: <http://nzhta.chmeds.ac.nz>

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LIST OF ABBREVIATIONS

A&E	–	Accident & Emergency Department
BDI	–	Beck Depression Inventory
BSSI	–	Beck's Scale of Suicide Ideation
c.f.	–	compared with
CI	–	confidence intervals
CPN	–	community psychiatric nurse
DSP	–	deliberate self-poisoning
DSH	–	deliberate self harm
Dx	–	diagnosis
EMI-B	–	Emotional Well-Being inventory
ER	–	Emergency Room
ERFUT	–	Emergency Room Follow-up team
f/u	–	follow-up
GP	–	General Practitioner
GT-S	–	Giessen Test for self-image
HASS	–	Harkavy Asnis Suicide Survey
ITT	–	intention to treat
MA	–	meta-analyses
Nss	–	not statistically significant
Nssd	–	not statistically significantly different
OPC	–	outpatient clinic
RCT	–	randomised controlled trial
RR	–	risk ratio
Rx	–	treatment
SCL-90	–	Symptom Checklist (90 items)
SD	–	Standard deviation
SNAP	–	Successful Negotiation/acting Positively program
SR	–	systematic review
U-BO	–	Social Anxiety Questionnaire
ssd	–	statistically significant difference
Vs	–	versus
WHO	–	World Health Organisation

Scope of systematic review of suicide prevention

The development of this systematic review involved consultation between the NZHTA and the Suicide Working Group.

LITERATURE SEARCH

Main search terms

Medline subject terms (MeSH terms): suicide, suicide attempted, self-injurious behavior, triage, “referral and consultation”, risk assessment, risk factors, documentation, emergency medical services, emergency medical service communication systems, emergency service hospital, emergency services psychiatric, exp quality of health care, time factors, medical history taking, exp hospitalization.

Psychinfo subject terms: attempted suicide, suicidal ideation, suicide, suicide prevention, suicide prevention centers, professional referral, intake interview, evaluation, needs assessment, psychiatric evaluation, evaluation criteria, psychological assessment, risk analysis, psychiatric hospital admission, hospital admission, psychiatric hospitalization, psychiatric hospital readmission, commitment psychiatric, treatment planning.

Additional keywords: triag*, priorit*, suicid*, or parasuicid*.

Principal sources of information

The following databases were searched using the search strategies outlined in **Appendix 1: Search strategies**.

Bibliographic databases

Medline
Embase
Cinahl
Psychinfo
Current Contents
Science/Social Science Citation Index
Index New Zealand

Review databases

Evidence-based medicine reviews
Cochrane Database of Systematic Reviews
DARE
NHS Economic Evaluation Database
Health Technology Assessment Database

The search was restricted to information from 1990 in English. Each research question required a separate literature search.

Note: hand searching of journals, or contacting of authors for unpublished research was not undertaken during the search process.

The complete search strategies are given in **Appendix 1: Search strategies**.

INCLUSION AND EXCLUSION CRITERIA

Inclusion and exclusion criteria were firstly applied to the abstracts captured by the literature searches. Those papers considered for inclusion in the literature appraisal were retrieved and this warranted the exclusion of further papers based on the availability of these in full text.

Peer reviewed studies were considered for this review if they used one of the following study designs:

- systematic review or meta-analysis
- randomised controlled trial (RCT)
- controlled clinical trial (CCT)
- cohort study
- case-control study
- quasi-experimental – e.g., before and after study
- descriptive study.

Note: the ‘grey’ literature was included, where appropriate, for New Zealand specific studies looking at special population groups: Maori, Pacific Island, Asian and the elderly.

STUDY INCLUSION CRITERIA

The following criteria was used to **include** studies for appraisal:

- study population are persons presenting following suicide attempt, expressing suicidal ideation, suicide threat
- study set in emergency department
- study set in tertiary mental health service
- study published in 1990 or later
- study written in English
- outcomes considered include:
 - repeat presentations for suicidality
 - repeat suicide attempts
 - mortality from suicide.

STUDY EXCLUSION CRITERIA

The following criteria was used to **exclude** studies from appraisal:

- study population primarily (50% or more) those with deliberate self-harm in the absence of suicide intent
- study population primarily (50% or more) those involved in assisted suicide
- study population primarily (50% or more) presentations for self-mutilation
- study population primarily (50% or more) children 12 years of age and under
- study focus is on the treatment of people with drug/substance abuse or dependence, that is treatment directed to their addiction rather than any suicide attempt
- study population are criminal offenders
- studies on suicide prevention interventions specifically for people with HIV/AIDS
- studies with small numbers of case presentations (one to five cases)
- studies concerned with suicide in homicidal people
- studies concerned with school-based suicide prevention interventions
- studies concerned with economic analyses
- citations which are letters to the editor, comments, editorials, abstract only
- studies where population is primarily a special population – e.g., with affective or underlying personality disorder (and therefore potential confounded of study results and treatments).

STUDY SELECTION

Studies were selected for appraisal using a two-stage process. Initially, the titles and abstracts (where available) identified from the search strategy were scanned and excluded as appropriate. The full text articles were retrieved for the remaining studies and these were appraised if they fulfilled the study selection criteria outlined above.

One hundred and thirty-seven papers were identified via the search strategy and 35 retrieved (three as background only). Currently, eight papers have been formally reviewed and 26 papers excluded (one paper still awaiting interloan).

EVIDENCE TABLES

Summaries of appraisal results are shown in tabular form and include:

- study reference and country
- study design
- study quality grading and evidence level
- study arm description of intervention, service, treatment
- patient inclusion and exclusion criteria
- number of patients included in study sample
- study outcomes and p-values and/or 95% confidence intervals
- comments on the study and its internal validity issues arising from the study appraisal.

P-values unless otherwise stated relate to between group comparisons.

APPRAISAL METHODOLOGY

Articles were formally appraised using the checklist schedules and hierarchy of evidence coding system developed by the Scottish Intercollegiate Guidelines Network (SIGN). Validated criteria were used to appraise the studies selected for review. Key facets of the selected studies (including limitations) were documented in the text. Conclusions were drawn based on the study design and the specific problems associated with individual studies. The evidence presented in the selected studies were assessed and classified according to the SIGN grades of guideline recommendation by the suicide prevention guideline group.

The final grading code was allocated based upon the study design and study quality.

For a Systematic Review, Meta-Analysis or RCT studies the grades were (1++, 1+ or 1-). To receive a 1++ grading, the following criteria needed to be fulfilled:

- clearly defined study question
- a clear description of an adequate randomisation design and process
- absence of baseline differences in demographic variables and other potential confounding variables between intervention groups post-randomisation
- an adequate concealment method and use of single blinding in outcome assessment
- outcomes measured in a standard, valid and reliable way
- all study arms treated equally
- adequate statistical power
- an ITT analysis was presented.

Factors (four or more) that consigned studies to a 1- grading included:

- open study
- study groups were not treated equally
- ITT analysis not presented, analysis not based on randomised allocation
- baseline study differences
- outcome assessment not blinded to allocation

- inadequate method or description of randomisation and concealment
- significant omissions or errors in patient demographic information and outcome results.

All other Systematic Review, Meta-Analysis and RCT studies were graded as 1+.

For a case-control or cross-sectional study to receive a 2++ grading, the following criteria needed to be fulfilled:

- clearly defined and appropriate study question
- unbiased selection of subjects from a comparable population(s)
- (for case-control studies only) cases and controls clearly defined and differentiated; controls clearly non-cases
- good reporting of baseline variables and inclusion and exclusion criteria
- blinding of investigators to previous test results or other factors that could bias testing
- outcomes measured in a standard, valid and reliable way
- all subjects in study treated equally
- adequate statistical analysis
- an appropriate follow-up period and prospective, longitudinal analysis.

Papers that met the above criteria with the exception of including an appropriate follow-up period and prospective, longitudinal analysis were given a ranking of 2+.

Factors (four or more) that consigned studies to a 2- grading included:

- ill defined and/or inappropriate study question
- poorly described and/or biased selection process
- poorly defined and/or biased inclusion and/or exclusion criteria
- poor reporting of baseline variables and/or significant baseline study differences between groups (case-control studies)
- baseline study differences
- outcome assessment not blinded to allocation and/or blinding of investigators not described
- inadequate statistical analysis
- significant omissions or errors in patient demographic information and outcome results.

Non-analytical studies – e.g. case series and descriptive studies, are given an evidence grade of 3.

Within each grade, papers are presented in alphabetical order according to first author surname.

Study limitations

This question examines the efficacy of different outcomes associated with different triage models used for persons presenting following a suicide attempt, expressing suicidal ideation and suicide threat. Only one study could be identified that examined the triaging of suicide attempt patients (see **Table 1, page 7**). The question was therefore broadened to examine the triaging of interventions used in treating suicide attempt patients. Patients presenting following suicide attempt are not triaged, dependent on the presenting complaint, in the strict sense of the term possibly because at first presentation the vast majority of attempted suicides are treated as emergencies. Suicide attempts are, however, triaged in terms of treatment given and referral patterns and studies that assess these aspects are included in this report (see **Table 2, pages 8-14**). Primary outcomes considered are the impact during follow-up on repeat presentations for suicidality, repeat suicide attempts and mortality from suicide. Other outcomes, such as improvement in depression etc, are included where significant due to the paucity of good data answering this question.

Table 1 (page 7) and Table 2 (pages 8-14) contains all included, critically appraised papers. Appendices 1-3 contain excluded papers (and the reasons for exclusion), bibliography and search strategies. One descriptive study (graded 3) is presented in **Table 1 (page 7)**. While one RCT (grade 1-) and six case-control studies (all graded 2-) are presented in **Table 2 (pages 8-14)**. However, the six studies classified as case-controls (controlled clinical trials) were so poorly designed that they could almost be classified as descriptive case-series studies. Papers were excluded for several reasons: for providing level 4 (expert opinion) evidence only (six papers), fails to meet inclusion criteria (two papers), no intervention tested (six papers), no follow-up data presented (five papers), meeting other specific exclusion criteria (four papers), or not addressing the above research question (three paper).

Overall, the evidence suggests that no firm conclusions can be reached on the efficacy of different outcomes associated with different triage models used in people presenting following suicide attempt, largely due to the limited number of trials that have taken place and to the small size of most of these trials. The variety of interventions and non-standardisation of standard care makes comparison of outcomes associated with different triage models difficult. There is little evidence to suggest that different triage methods produce different outcomes in people presenting following suicidal crisis. From the evidence that was found, it would appear that psychosocial assessment to identify high-risk patients may be of some help in reducing repeat suicide attempts. However, there is no standardised psychosocial assessment for suicidal patients which makes assessment of triage methods and outcomes complicated.

Individual study limitations are described in the comment section in **Table 1 and 2 (page 7-14)**.

Limitations to the review methodology that need to be considered in developing the suicide prevention guideline, include restriction to:

- articles published from 1990 onwards
- the published literature
- English language articles only
- reviewing each study by one researcher only
- study evaluation criteria did not cover aspects of statistical methodology such as the appropriateness of the data collected and the statistical tests used to analyses this.

In developing a guideline for suicide prevention, consideration will need to be given to studies published pre-1990. Important articles of interest may have been published in the pre-1990 time period so methods should be developed by the guidelines group to assess whether the new evidence presented in this review is sufficient to alter any recommendations included in previous evidence-based guidelines.

Restriction to the published literature is likely to lead to bias since the unpublished literature tends to consist of studies not identifying a significant result.

Restriction to English language may result in study bias, but the direction of this bias cannot be determined.

None of the articles appraised were set in New Zealand. Therefore, the generalisability of these studies to the New Zealand setting needs to be considered.

The studies were initially selected by examining the abstracts of these articles. Therefore, it is possible that some studies were inappropriately excluded prior to examination of the full text article.

There is a limitation on space in **Tables 1 and 2 (pages 7-14)** therefore, study details have been summarised.

This review was conducted over a limited timeframe (March 2002 – May 2002).

Table 1. Evidence table of appraised articles

Title of review: Are different triage models associated with different outcomes in people presenting following suicidal ideation/threat/attempt?

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
<p>(Taylor et al. 1998)</p> <p>Descriptive study</p> <p>Grade 3</p> <p>Country: Australia</p>	<p>Comparison: To compare DSP Rs with DSP NRs.</p> <p>Outcome measures: Triage category of DSP Rs c.f. DSP NRs.</p> <p>Further presentation to ER with a diagnosis of DSP.</p>	<p>Inclusion criteria: All recorded DSP who presented alive to emergency department.</p>	<p>Study period 1 Jan 1993 – 31 Dec 1994 + f/u 12 months after study period.</p> <p>335 NRs and 46 Rs who made a total of 106 presentations (mean = 2.3 presentations per repeater).</p> <p>225 (67.2%) NRs were female and 31 (67.4%) Rs were female nss The largest age group of NRs was 15 – 24 (n = 132, 39.4%) nss The largest age group of Rs was 25 - 34 (n = 19, 41.3%) nss</p> <p>12/335 NRs triaged as category 1 c.f. 0/106 Rs (OR 8.23, p = .04) 30/335 NRs triaged as categories 4&5 c.f. 18/106 (OR 0.48, p = .023) Rs & NRs spent similar times in ER 263 (78.5%) NRs c.f. 81 (76.4%) Rs spent less than six hours in ER 208/335 NRs admitted c.f. 57/106 (OR 1.85, p = .009). 23 NRs admitted to psychiatric ward c.f. 9Rs (or 0.79, p = .58) 20 NRs c.f. 17 NRs had psychiatric outpatient referrals arranged (OR 0.33, p = .002) 24 NRs c.f. 4 Rs were discharged home without f/u arrangements (OR 1.97, p = .22) Three (0.68%) NRs and 0 Rs died in hospital as a result of their DSP.</p> <p>12 month f/u showed 5 (10.9%) Rs c.f. 15 (4.5%) NRs presented after DSP in 1995 (OR 0.38, p = .078). No completed suicides reported.</p> <p>Three Rs lost to f/u.</p>	<ul style="list-style-type: none"> ▪ a retrospective analysis of ED computerised records was undertaken for the two year study period ▪ NRs were defined as patients who made a 'single presentation' only, after overdose, during the study period. This was regardless of whether the patient had ever presented, after overdose, before the study period ▪ Rs were defined as patients who made two or more presentations, after overdose, during the study period ▪ information is not given on the triage categories originally given to the patients who re-presented in 1995 ▪ methodological problems: <ul style="list-style-type: none"> - some DSP may not have sought medical care or may have been managed by other health care providers - possible bias introduced as study only includes patients who presented alive to the ER - as only the ER records searched it was not possible to determine if any known NRs or Rs died outside of hospital during or after the study period. The proportion of single presenters (NRs) who DSP before the study period is not known hence true rates of Rs not known.

Table 2. Evidence table of appraised articles

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Guthrie et al. 2001) RCT Grade 1- Country: England	Four sessions of therapy delivered in the patients home Vs standard treatment. Outcome measures: Severity of suicide ideation six months after treatment as assessed by the BSSI and self-reported subsequent attempts at DSH. Secondary outcome measure included depressive symptoms at six months f/u as measured by the BDI.	Inclusion criteria: Patients presenting at A&E with an episode of DSP aged between 18-65, able to read and write English, living within the catchment area of the hospital, registered with a GP and not need inpatient psychiatric treatment.	587 adults presented with DSP during the recruitment period, of these 354 were ineligible. Of the 233 patients eligible for the study 119 (51%) agreed to participate. These 119 patients were similar to those who declined in terms of sex and employment status but were more likely to have a history of DSH (59% Vs 45%), to have left a suicide note at the time of current episode (23% Vs 5%), and express a wish to die (76% Vs 46%). Of the 119 participants, 66 (56%) were women and mean (SD) age was 31.2 (1.5) years. Seventy-one (60%) had a history of DSH, and 67 (56%) had a history of psychiatric treatment. The intervention and standard treatment groups were similar in terms of baseline characteristics with the exception of marital status (8 Vs 25 married respectively). Patients who received psychotherapy showed greater improvement on the BSSI 2.8, $p = .005$ and BDI (18.8 Vs 23.7, $p = .037$) c.f. patients who received standard treatment. When adjusted for differences in marital scale between the groups, the differences in the scores on BSSI remained significant ($p = .027$) but the score for BDI did not ($p = .11$). At six month f/u, five patients (9%) in the intervention group c.f. 17 patients (28%) in the standard treatment group had repeated DSH ($p = .009$). There were no suicides in either group during the f/u period.	<ul style="list-style-type: none"> ▪ patients in the intervention group were offered four sessions of psychodynamic interpersonal therapy, delivered in the patient's home by a nurse therapist, within one week of presentation. The therapy entails identifying and helping to resolve interpersonal difficulties which cause or exacerbate psychological distress ▪ treatment as usual consisted of an assessment by a casualty doctor or a junior psychiatrist in the ER and referral back to they GP ▪ a possible limitation is that 67 (56%) of participants had a history of psychiatric treatment although the psychiatric morbidity is not discussed. The study may therefore have met our exclusion criteria at the very least the results may not be generalisable to other groups of people who DSH but have less severe psychological problems ▪ methodological concerns. Possible biases include: <ul style="list-style-type: none"> - the large number (119/587) not entered into the study - the exclusion criteria excluded people who were possibly at increase risk of suicidal behaviour in the future (e.g. patients who needed to be admitted were excluded yet these may have been the more serious cases) - only half of the eligible participants agreed to participate - the data regarding further episodes of DSP are based on self-reporting and may therefore be affected by 'interpretation' or 'reporting' bias.

Table 2. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Aoun 1999) case-control Grade 2- Country: Australia	Intensive outreach services provided by a suicide intervention counsellor (SIC) Vs Standard treatment. Outcome measures: Repetition of suicide attempt or DSH.	Inclusion criteria: For the intervention group – all patients referred to the SIC from the wards, A&E, and community (outpatient) referrals. Control group – all patients who presented to A&E, receive standard care and are referred to their GP + patients admitted to the ward but refused counselling or f/u.	During the 22 month study period (Nov 1995 – Aug 1997) 208 patients were f/u by the SIC and 87 patients received standard care (controls). 77 (37%) had attempted suicide and 131 (63%) were considered at risk of DSH. Re-admissions for suicide attempts up to three years after index attempt were 3/84 (3.6%) in the intervention group c.f. 11/87 (12.6%) in the control group, $p = .015$. Hospital log sheets were also reviewed for a 22 month period prior to the start of the intervention period in Nov 1995. Results showed that re-admission for the intervention period was 3/84 (3.6%) c.f. 13/117 (11.1%) for the pre-intervention period ($p = .0257$). Re-admission following standard care was 11/87 (12.6%) c.f. 13/117 (11.1%) for the pre-intervention period (nss).	<ul style="list-style-type: none"> ▪ main tasks of the SIC were risk estimation, crisis management, establishment of a therapeutic alliance with the client, co-ordination of adequate follow-up and appropriate long-term treatment, and improvement of liaison between community-based referrals and treatment agencies. Patients were seen by the SIC within 48h of admission and a comprehensive psychosocial assessment was carried out. Patients were f/u intensively for an initial period of six weeks after discharge from hospital or following a community referral. The management of the patients was planned with GPs, other health professionals and support agencies ▪ standard treatment consists of standard medical care and referral to own GP. Also included in this group for analysis purposes was people who were admitted to the ward but refused counselling or a f/u ▪ methodological concern: <ul style="list-style-type: none"> - unsure whether the DSH patients had suicide ideation - both groups' characteristics similar except significantly more females and patients aged <45 were in the intervention group - some data difficult to interpret - some inconsistencies in data reported.

Table 2. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Hickey et al. 2001) Case-control Grade 2- Country: England	DSH patients discharged directly from A&E after a psychiatric assessment. Vs DSH patients discharged from A&E without an assessment. Outcome measures: Repetition of DSH.	Inclusion criteria: All DSH patients, aged 15 and older, who were discharged directly from A&E. Exclusion criteria: Patients with no fixed abode; patients living outside the catchment area; patients who were in psychiatric in-patient care at time of presentation and those for whom the above information was not available.	Over the 12 month study period 246 patients attended A&E for DSH and were not admitted. 101 had a psychiatric assessment and 145 did not. 88 subject pairs were matched by age, sex and type of DSH. Seven non-assessed patients had at least one further episode of DSH within the following 28 days compared to two assessed patients (nss). 29 non-assessed patients had a further episode of DSH within 12 months c.f. 10 assessed patients (p = .0005). Using combined information from the monitoring system & GPs, 33 non-assessed patients repeated DSH within a year c.f. 16 assessed patients (p = .007). Four deaths occurred during the 4-6 year f/u all in the non-assessed group. One was due to drug overdose, one was alcohol related, one was natural causes and one was cause unknown.	<ul style="list-style-type: none"> ▪ the psychosocial assessment was carried out by a psychiatric team, however no mention is made of the form this assessment took ▪ methodological concern: <ul style="list-style-type: none"> - f/u information from GPs was not available for all patients - only 88 of the 141 non-assessed patients were matched with a control. The 53 not f/u may have introduced a bias - in order to identify controls for more non-assessed subjects, patients were also included from a period that was extended by six months before and six months after the study period - the exclusion criteria excluded people who were possibly at increase risk of suicidal behaviour in the future (e.g. patients who needed to be admitted were excluded yet these may have been the more serious cases) - Patients with certain characteristics were less likely to have been assessed (e.g. aged 20-34, history of past DSH, no self-injury, presenting between 5pm-9am and showing difficult behaviour). Confounding may therefore have occurred - DSP patients were more likely to be admitted the results may not therefore be generalisable to this sub-population.

Table 2. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
<p>(Morgan et al. 2000)</p> <p>Case-control</p> <p>Grade 2-</p> <p>Country: Wales</p>	<p>DSH patients treated after the introduction of the DSH assessment service Vs DSH patients treated before the introduction of the DSH assessment service.</p> <p>Outcome measures: Any further presentations to the hospital with DSH in the year following initial presentation.</p>	<p>Inclusion criteria: All 16-65 year old patients who presented to A & E with a diagnosis of DSP through two corresponding time periods.</p>	<p>During Period 1 (1st March – 31st July 1996) 142 individuals presented to A&E following DSH. 59 men and 83 women. Mean age 29. 88.</p> <p>During Period 2 (1st March – 31st July 1997) 198 individuals presented to A&E following DSH. 94 men and 104 women. Mean age 31.46.</p> <p>In period 1 66/142 patients (46.47%) re-presented with DSH within 12 months of initial presentation c.f. 69/198 patients (34.8%) in period 2 p = .03.</p> <p>In period 1 18/35 (51.43%) patients who were assessed re-presented with DSH within 12 months of initial presentation c.f. 31/101 (30.69%) in period 2 p = .027.</p> <p>During period 1 all psychosocial assessments (n = 35) were completed by medical staff. During period 2 51 (50.49%) were completed by nursing staff and 50 (49.51%) by medical staff. Re-presentation rates with DSH were lower when assessment carried out by nurses (n = 12, 23.53%) c.f. medical staff (n = 31, 38%).</p> <p>A higher number of individuals reported misuse of alcohol in Period 1 (26.8%, n = 38) c.f. Period 2 (20.7%, n = 40). No further analysis carried out.</p> <p>Men constituted a lower percentage of the presentations in Period 1 (41.5%, n = 59) c.f. Period 2 (47.4%, n = 94). No further analysis carried out.</p> <p>The rate of self-reported misuse of drugs was similar for both Period 1 (11.3%, n = 16) and Period 2 (11.9%, n=23).</p> <p>More patients reported previous contact with mental health services in Period 1 (55.5%, n = 79) c.f. Period 2 (46.7%, n = 91). No further analysis carried out.</p>	<ul style="list-style-type: none"> ▪ the DSH assessment service consisted of an appointment of a 'liaison nurse' along with the creation of a team of nurses and medical staff. The intention of the service is to assess all presentations of DSH that were referred to the service within 24h, with the ultimate goal of increasing the number of referrals, so that eventually all presentations would receive a psychosocial assessment. The service was available 24h a day, seven days a week ▪ DSH assessment service consisting of an appointment of 'liaison nurse' along with the creation of a team of nurses and medical staff ▪ methodological concerns: <ul style="list-style-type: none"> - the potential lethality of DSP attempts was not recorded, this is likely to affect the decision as to whether or not an individual has a psychosocial assessment - No statistical analysis of re-presentation with DSH following assessment by nurses Vs medical staff. both groups characteristics similar - the information was collected from hospital records and as such is likely to be incomplete or inaccurate - the duration of the study is relatively short and the time period chosen was the first five months of the new DSH assessment. This makes it probable that the information obtained does not portray an entirely accurate picture of the service as it operates currently - Repetition of DSH was assessed by repeat hospital attendance rates only (episodes treated by GP and/or no treatment sought not recorded) - Some of the characteristics differ between Periods 1 and 2 and these differences may be potential confounders.

Table 2. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Owens et al. 1991) case-control study Grade 2- Country: England	Intervention/ comparisons: Hospital admission following DSP Vs discharge home from A&E and discharge home from A&E with f/u psychiatric appointment Vs discharge home from A&E with no f/u. Outcome measure: Re-attendance due to repeat DSP or/and deaths recorded as suicide or open verdicts.	Inclusion criteria: All episodes of deliberate self-poisoning dealt with in A&E between Nov 1985 - July 1986. Cases were included if at arrival the clerical staff recorded present compliant as 'overdose' or 'self-poisoning'. In addition, A&E records of attendances were also examined weekly to detect those cases not identified at arrival (71 [6%] were identified in this way).	1,096 attendances for 992 patients during 9 month study period (Nov 1985 – July 1986), 600 women and 392 men ages not given. Of the 1,096 episodes 761 (69%) were admitted. 335 (31%) were discharged. 116 of 992 re-attended A&E due to DSP within 1 year; 81/687 (11.8%) of admitted patients, 35/305 (11.5%) of discharged patients (95% CI = 0.7 - 1.5). Of the 1096 episodes, 761 (69%) were admitted, and 335 were discharged from A&E. Of those discharged from A&E 88/335 (26%) were given an outpatient psychiatrist appointment. Repetition rates were 81/687 (11.8%) for patients admitted and 35/305 (11.5%) for those discharged from A&E nss. Those discharged from A&E with no f/u arrangements (165 patients) had lowest repeat rates 15/165 (9%) Vs 16/114 (14%) in patients seen by a psychiatrist and 81/687 (11.8) in patients admitted. No further results given. During a three-year f/u, 11 of the 881 patients in the catchment area died with a verdict of suicide or an open verdict. 8/605 (1.3%) belonged to admitted group and 3/276 (1.1%) to discharged group (95% CI = 0.3 - 4.6). Younger patients more likely to be discharged from A&E, 34% of under 35 years discharged c.f. 17% of those over 55years. Recent physical ill-health, expressing a threat or leaving a note, and record of previous psychiatric admission were more likely to be admitted (figures not given). Differing characteristics for patients discharged from A&E and given a psychiatric appointment and those discharged from A&E with no f/u are not given.	<ul style="list-style-type: none"> ▪ f/u was three years from date of first attendance during study period for suicide and contact with psychiatric services and one year for repeat DSP ▪ at the time of the study it was hospital policy for DSH patients to be dealt with first in A&E, not admitted directly to medical wards ▪ in addition to routine clinical information recorded on each patient A&E medical staff completed a research checklist of risk factors derived from published research findings ▪ from A&E attendance records, used to check for any repetition of self-poisoning within one year from the date of each patient's inclusion in the study ▪ the checklist included only those items which could be collected by A&E staff; many of them are self-reported by the patients or confirmed by their relatives this could mean values are underestimates ▪ methodological disadvantages include: <ul style="list-style-type: none"> - patients admitted directly to in-patient wards were not included - it may be that some cases of repetition were not detected by methods of follow-up - failure to fill in checklists was not a random event and the completion rate was lower among male patients who arrived during the night, and those who were very drowsy or unconscious therefore some systematic error seems likely although the direction of the effect is uncertain - intervention group more likely to be older, have had a recent physical ill-health, expressed a threat or left a note, and/or had a record of previous psychiatric admission - shortfalls in completion of checklist occurred for all risk factors - some of the characteristics differ between patients admitted and those not admitted. These differences may be potential confounders.

Table 2. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ Comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Suokas et al. 1991) Case-control Grade 2- Country: Finland	Psychiatric consultation after attempted suicide Vs no consultation. Outcome measures: Suicide mortality.	Inclusion criteria: Consecutive DSP patients treated in ER. Exclusion criteria: Alcoholics or drug addicts who did not attempt suicide. Suicide attempts by methods other than poisoning (approx. 15%).	1,018 subjects made 1,207 attempts during the study period (1983). 54% of subjects had psychiatric consultation. 53% of the patients were under 35 years old and 53% were women. 69% of patients without psychiatric consultation were left without arranged after-care and 22% were only advised to seek further treatment c.f. 4% left without further psychiatric treatment in the patients who received a psychiatric consultation. During the 5.5 years f/u 3.2% in the group without psychiatric consultation had committed suicide c.f. 3.6% in the group with psychiatric consultation.	<ul style="list-style-type: none"> ▪ lethality was assessed based on the physical condition of the patient and the amount and type of drugs taken. Four defined grades were used: mild, moderate, serious very serious. The somatic severity was less serious for those not consulted. When lethality was mild, 71% of the patients were not consulted c.f. 24% moderate, 15% serious and 12% very serious patients ▪ multiple methodological problems: ▪ self-poisoning repetition rates not reassessed ▪ data is often lacking so no chance to check given results and analytical data not given ▪ while some data on f/u and outcome is given no analysis was carried out ▪ information on occurrence of death was obtained from National Registry Centre of Finland and cause of death ascertained from autopsy reports (true rates may be higher) ▪ 47% of the patients had previous psychiatric in-patient treatment and 60% had had outpatient care.

Table 2. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Suokas et al. 1990) Case-control Grade 2- Country: Finland	Psychiatric consultation after attempted suicide Vs no consultation. Outcome measures: Suicide mortality.	Inclusion criteria: Consecutive DSP treated in ER. Exclusion criteria: Alcoholics or drug addicts who did not attempt suicide. Suicide attempts by methods other than poisoning (approx. 15%).	1,018 subjects made 1,207 attempts during the study period (1983). F/u was for 5-6 years. 54% of patients were referred for psychiatric consultation. By end of 5-6 year f/u period 33 (3.2%) patients had committed suicide, 12 (2.2%) women and 21 (4.4%) men. 21% of suicides occurred within 1 month after index suicide attempt, and 55% of suicides took place during the first year of the f/u period. During the first f/u year, men aged 30-49 and men left without psychiatric consultation had a greater risk of suicide (numbers not given). Those who later committed suicide were less often referred for psychiatric consultation (59% Vs 58%). Amongst those referred for consultation, the expected suicides were 3 for mild cases and 18 for severe cases; actual suicide figures were 4 and 16. Cumulative suicide rates for those having no psychiatric consultation was 1.9% c.f. 3.1% in those referred for consultation when lethality was assessed to be mild. When lethality was assessed to be severe, the cumulative incidence rate became 5.8% for those without consultation c.f. 3.6% in those referred for consultation. The relative risk for suicide among those without consultation was 0.6% when lethality was mild c.f. 1.6% when lethality was severe. Therefore when lethality was severe, those without psychiatric consultation had a greater risk for suicide (nss). Of those whose index suicide attempt was assessed as non-impulsive (64%) 6.7% later committed suicide, 6% had a psychiatric consultation and 10% did not. When the suicide attempt was assessed as impulsive 2% had a psychiatric consultation and 2% did not.	<ul style="list-style-type: none"> ▪ lethality was assessed based on the physical condition of the patient and the amount and type of drugs taken. Four defined grades were used: mild, moderate, serious very serious. For 46% of the patients the degree of somatic severity was assessed as mild. The other three groups were combined and labelled as severe ▪ suicide attempt was classified as impulsive if it was preceded by disappointment, hardship, a quarrel or some other kind of conflict, and as non-impulsive if it had been contemplated and planned (36%) ▪ this study evaluates outcomes over 18 month f/u post-ER ▪ 41% of the patients had previous psychiatric in-patient treatment and 56% had had outpatient care ▪ information on occurrence of death was obtained from National Registry Centre of Finland and cause of death ascertained from autopsy reports (true rates may be higher) ▪ only suicides that were officially determined to be certain suicides were used in this study (true rates may be higher) ▪ multiple methodological problems: <ul style="list-style-type: none"> - DSP repetition rates not reassessed - data is often lacking so no chance to check given results and analytical data not given.

Appendix 1: Search strategies

CINAHL

- 1 suicide/ or suicidal ideation/ or suicide, attempted/ (1982)
- 2 parasuicid\$.tw. (38)
- 3 suicid\$.tw. (2193)
- 4 self-injurious behavior/ (41)
- 5 injuries, self inflicted/ (222)
- 6 or/1-5 (3052)
- 7 TRIAGE/ or "TRIAGE (IOWA NIC)"/ (1049)
- 8 priorit\$.tw. (3162)
- 9 triage.tw. (829)
- 10 "referral and consultation"/ (2895)
- 11 or/7-10 (7272)
- 12 6 and 11 (75)
- 13 exp Emergency Service/ (3944)
- 14 emergency department.tw. (2772)
- 15 psychiatric emergency.tw. (61)
- 16 or/13-15 (5489)
- 17 Patient Admission/ (1398)
- 18 refer\$.tw. (11129)
- 19 "Referral and Consultation"/ (2895)
- 20 Patient Assessment/ (1365)
- 21 program evaluation/ (4470)
- 22 or/17-21 (19846)
- 23 6 and 16 and 22 (11)
- 24 12 or 23 (81)
- 25 from 24 keep [SELECTED REFERENCES] (12)

CURRENT CONTENTS

- 1 suicid\$.mp. (13343)
- 2 parasuicid\$.mp. (352)
- 3 1 or 2 (13404)
- 4 triag\$.mp. (1476)
- 5 priorit\$.mp. (16300)
- 6 3 and (4 or 5) (102)
- 7 emergency.mp. (25053)
- 8 acute.mp. (169307)
- 9 hospital\$.mp. (121104)
- 10 or/7-9 (285971)
- 11 risk assessment.mp. (9270)
- 12 patient discharge.mp. (192)
- 13 patient admission.mp. (128)
- 14 refer\$.mp. (152347)
- 15 or/11-14 (161266)
- 16 3 and 10 and 15 (186)
- 17 limit 16 to english language (169)
- 18 from 17 keep [SELECTED REFERENCES] (39)

EMBASE

- 1 suicidal behavior/ or self poisoning/ or suicide/ or suicide attempt/ (12756)
- 2 Automutilation/ (1888)
- 3 suicid\$.tw. (13723)
- 4 parasuicid\$.tw. (274)
- 5 or/1-4 (18650)
- 6 Emergency Health Service/ (4118)
- 7 triag\$.tw. (1641)
- 8 patient referral/ (7743)
- 9 priorit\$.tw. (10142)
- 10 or/6-9 (22771)
- 11 5 and 10 (332)
- 12 emergency ward/ (5722)
- 13 emergency health service/ (4118)
- 14 emergency.tw. (33565)
- 15 or/12-14 (36360)
- 16 hospital admission/ (8988)
- 17 patient referral/ (7743)
- 18 medical assessment/ (4072)
- 19 refer\$.tw. (1759537)
- 20 or/16-19 (1767739)
- 21 5 and 15 and 20 (360)
- 22 11 or 21 (618)
- 23 limit 22 to (english language and yr=1990-2002) (502)
- 24 from 23 [SELECTED REFERENCES] (55)

MEDLINE

- 1 suicide/ or suicide, attempted/ or self-injurious behavior/ (24670)
- 2 suicid\$.tw. (23481)
- 3 parasuicid\$.tw. (401)
- 4 or/1-3 (33229)
- 5 triage/ (3146)
- 6 triag\$.tw. (2761)
- 7 priorit\$.tw. (17076)
- 8 "referral and consultation"/ (30686)
- 9 4 and (5 or 6 or 7 or 8) (717)
- 10 emergency medical service communication systems/ or emergency medical services/ or emergency service, hospital/ or emergency services, psychiatric/ (35368)
- 11 risk assessment/ or risk factors/ (203665)
- 12 documentation/ (7703)
- 13 exp Quality of Health Care/ (2021624)
- 14 time factors/ (579083)
- 15 Medical History Taking/ (10260)
- 16 exp Hospitalization/ (78347)
- 17 10 and (11 or 12 or 13 or 14 or 15 or 16) (15317)
- 18 4 and 17 (333)
- 19 9 or 18 (982)
- 20 limit 19 to (english language and yr=1990-2002) (526)
- 21 letter.pt. (451100)
- 22 editorial.pt. (136399)
- 23 20 not (21 or 22) (514)
- 24 from 23 keep [SELECTED REFERENCES] (82)

PSYCINFO

- 1 attempted suicide/ or suicidal ideation/ or suicide/ or suicide prevention/ or suicide prevention centers/ (13077)
- 2 suicid\$.tw. (19432)
- 3 parasuicid\$.tw. (500)
- 4 or/1-3 (19713)
- 5 intake interview/ (133)
- 6 triag\$.tw. (229)
- 7 professional referral/ (1910)
- 8 priorit\$.tw. (5417)
- 9 or/5-8 (7647)
- 10 4 and 9 (154)
- 11 exp emergency services/ (1727)
- 12 evaluation/ or needs assessment/ or psychiatric evaluation/ or evaluation criteria/ or psychological assessment/ (9595)
- 13 risk analysis/ (1822)
- 14 psychiatric hospital admission/ or hospital admission/ or psychiatric hospitalization/ or psychiatric hospital readmission/ or "commitment (psychiatric)"/ (7253)
- 15 treatment planning/ (711)
- 16 or/12-15 (19161)
- 17 4 and 10 and 16 (18)
- 18 10 or 17 (154)
- 19 limit 18 to (english language and yr=1990-2002) (108)
- 20 from 19 keep [SELECTED REFERENCES] (20)
- 21 from 22 keep 3 (1)

Appendix 2: Bibliography of included studies

INCLUDED, CRITICALLY APPRAISED STUDIES

Aoun S. (1999). Deliberate self-harm in rural Western Australia: results of an intervention study. *Australian & New Zealand Journal of Mental Health Nursing*, 8, 65-73.

Guthrie E., Kapur N., Mackway-Jones K., Chew-Graham C., Moorey J., Mendel E., Marino-Francis F. et al. (2001). Randomised controlled trial of brief psychological intervention after deliberate self poisoning. *BMJ*, 323, 135- 137.

Hickey L., Hawton K., Fagg J. & Weitzel H. (2000). Deliberate self-harm patients who leave the accident and emergency department without a psychiatric assessment. A neglected population at risk of suicide. *Journal of Psychosomatic Research*, 50, 87-93.

Morgan V. & Coleman M. (2000). An evaluation of the implementation of a liaison service in an A&E department. *Journal of Psychiatric and Mental Health Nursing*, 7, 391-397.

Owens D., Dennis M., Jones S., Dove A. & Dave S. (1991). Self-poisoning patients discharged from accident and emergency: risk factors and outcome. *Journal of the Royal College of Physicians of London*, 25, 218-222.

Suokas J & Lonnqvist J. (1990). Selection of patients who attempt suicide for psychiatric consultation. *Acta Psychiatrica Scandinavica*, 83, 179-182.

Suokas J & Lonnqvist J. (1991). Outcomes of attempted suicide and psychiatric consultation: risk factors and suicide mortality during a five-year follow-up. *Acta Psychiatrica Scandinavica*, 84, 545-549.

Taylor DM. (1998). Recurrent overdose: patient characteristics, habits, and outcomes. *Journal of Accident & Emergency Medicine*, 15, 4, 257-261.

Appendix 3: Bibliography of excluded studies

EXCLUDED, RETRIEVED STUDIES

The following papers were reviewed but rejected for inclusion in the analysis:

AACAP. (2001). Summary of the practice parameters for the assessment and treatment of children and adolescents with suicidal behavior. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 495-499.

Retrieved for background purposes only, guideline review of the assessment and treatment recommendations of children and adolescents with suicidal behavior. No intervention tested.

Appleby L., Morriss R., Gask L., Roland M., Lewis B., Perry A., Battersby L. et al. (2000). An educational intervention for front-line health professionals in the assessment and management of suicidal patients (The STORM Project). *Psychological Medicine*, 30, 805-812.

No actual suicidality figures/rates assessed, results based on projected cost-effective improvement in suicidality treatment following training.

Boyce P., Oakley-Browne M. & Hatcher S. (2001). The problem of deliberate self-harm. *Current Opinion in Psychiatry*, 14, 2, 107-111.

Expert opinion only. No interventions tested.

Cubbin S., Llewellyn-Jones S. & Donnelly P. (2000). How urgent is urgent? Analysing urgent out-patient referrals to an adult psychiatric service. *International Journal of Psychiatry in Clinical Practice*, 4, 233-235.

Fails to address research question. Study assesses types of cases marked as requiring urgent psychiatric treatment. Suicidal ideation not analysed.

Currie A. & Blennerhassett R. (1999). Deliberate self-harm: how feasible are the current guidelines? *Irish Journal of Psychiatric Medicine*, 16, 61-63.

Study focuses on the operation of a DSH service in relation to referrals received from A&E or elsewhere in a hospital. Study meets the exclusion criteria as study population consists of persons presenting with impulsive acts of DSH with low risk of suicide intent. No primary outcomes tested. No follow-up of subjects. Study fails to address the research question.

Dennis M., Evans A., Wakefield P. & Chakrabarti S. (2001). The psychosocial assessment of deliberate self harm: using clinical audit to improve the quality of the service. *Emergency Medicine Journal*, 18, 448-450.

Descriptive audit only, no follow-up of suicide ideation/attempt/completion analysed.

Francis E., Marchand W., Hart M., Carter A., Schinka J., Feldman A. & Ordorica P. (2000). Utilization and outcome in an overnight psychiatric observation program at a veterans affairs medical center. *Psychiatric Services*, 51, 92-95.

To be admitted to the program patients had to exhibit psychiatric symptoms. Little data on suicide ideation/attempt and suicidal patients not separately identified in analysis.

Hatcher S. (1997). A survey of deliberate self harm services in New Zealand: shouldn't we be doing better? *New Zealand Medical Journal*, 110, 74-75.

Descriptive survey, no intervention tested.

Henggeler S., Rowland M., Randall J., Ward D., Pickrel S., Cunningham P., Miller S. et al. (1999). Home-based multisystemic therapy as an alternative to the hospitalization of youths in psychiatric crisis: clinical outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1331-1339.

Study group were youths (average age 13.0 years) with serious emotional disturbances who were all classified with a mental illness severe enough to warrant psychiatric hospitalisation based on the American Academy of Child & Adolescent Psychiatry. Only 32% of the subjects had suicide attempt/plan/ideation while 42% threatened to harm themselves or others and 11% had Psychosis (both exclusion criteria). Suicide attempt/plan/ideation was not analysed separately.

Hollander J., McCracken G., Johnson S., Valentine S. & Shih R. (1999). Emergency department observation of poisoned patients: How long is necessary? *Academic Emergency Medicine*, 6, 887-894.

Fails to meet inclusion criteria, as 50% of the DSH subjects had no suicide intent.

Hurry J., Storey P. (2000). Assessing young people who deliberately harm themselves. *British Journal of Psychiatry*, 176, 126-131.

Questionnaire survey with no follow-up, nor any relevant primary outcomes.

Job T. (1999). A system for determining the priority of referrals within a multidisciplinary community mental health team. *British Journal of Occupational Therapy*, 62, 486-490.

Descriptive audit only, no interventions tested.

Lyons C., Price P., Embling S. & Smith C. (2002). Suicide risk assessment: a review of procedures. *Accident & Emergency Nursing*, 8, 178-186.

Outlines of new assessment procedure for suicidal patients. No data presented.

McElroy A. & Sheppard G. (1999). The assessment and management of self-harming patients in an Accident and Emergency department: an action research project. *Journal of Clinical Nursing*, 8, 66-72.

Failed to meet inclusion criteria as only four subjects studied. No data given on cases studied. Article concerned with training of A&E staff.

O'Neill K., Horowitz L., Smith M., Levin C. & Klavon S. (2001). Recognizing suicide risk in a pediatric emergency department: A change in nursing care. *Pediatric Emergency Care*, 17, 306-309.

Study addresses the development of clinical practice guidelines. No data analysed.

Press B. & Khan S. (1997). Management of the suicidal child or adolescent in the emergency department. *Current Opinions in Pediatrics*, 9, 237-241.

Treatment guideline. Expert opinion, level 4 evidence only.

Repper J. (1999). A review of the literature on the prevention of suicide through interventions in Accident and Emergency Departments. *Journal of Clinical Nursing*, 8, 3-12.

Non-systematic review article looking at DSH. Level 4 evidence only.

Ries R. (1997). Advantages of separating the triage function from psychiatric emergency service. *Psychiatric Services*, 48, 755-756.

Narrative material, no interventions tested.

Rotheram-Borus M. & Bradley J. (1991). Triage model for suicidal runaways. *American Journal of Orthopsychiatry*, 61, 1, 122-127.

Very little in the way of follow-up, methodologically inadequate, uses non-comparable outcome measures and is difficult to interpret.

Ryan J., Clemmett S. & Perez-Avila C. (1996). Managing patients with deliberate self harm admitted to an accident and emergency observation ward. *Journal of Accident and Emergency*, 13, 31-33.

No comparison of treatments and no follow-up of subjects.

Smart D., Pollard C. & Walpole B. (1999) Mental health triage in emergency medicine. *Australian and New Zealand Journal of Psychiatry*, 33, 57-66.

Retrieved for background purposes only. Assessment of triage methods when dealing with patients with mental health problems attending ER. Suicidality not examined.

Spooren D., Jannes C & Van Heeringen K. (1997). Factors influencing the decision for further hospitalisation or in-patient crisis intervention at the psychiatric emergency department of civil hospitals in Belgium. *Journal of Mental Health*, 6, 4, 399-407.

All psychiatric admissions were covered in this study of which attempted suicide accounted for only 425/8477 (5.6%). No follow-up.

Tumme R. (2001). A collaborative approach to urgent mental health referrals. *Nursing Standard*, 15, 52, 39-42.

Retrieved for background purposes only, descriptive audit only, no interventions tested.

Waterhouse J & Platt S. (1990). General hospital admission in the management of parasuicide. A randomised controlled trial. *British Journal of Psychiatry*, 156, 236-242.

Descriptive cross-sectional audit study with no relevant primary outcomes, no testing of crisis intervention. No follow-up of suicide risk.

Whyte I., Dawson A., Buckley N., Carter G. & Levey C. (1997). A model for the management of self-poisoning. *Medical Journal of Australia*, 167, 142-146.

Descriptive, comparative study with limited intervention testing and no follow-up of patients. Major methodological flaws.

Whyte S. & Blewett A. (2001). Deliberate self-harm. The impact of a specialist DSH team on assessment quality. *Psychiatric Bulletin*, 25, 101-104.

Clinical audit of changes in assessment of DSH patients presenting to A&E. No follow-up carried out, no primary outcomes analysed.